

Animal Behavior Quiz #5

Name _____

1. In this article "Nongenomic transmission across generations of maternal behavior and stress responses in the rat" (2 points)

(1A) the study suggests that individual differences in the expression of genes in brain regions that regulate stress reactivity can be transmitted from one generation to the next through _____ (a) "stress hormone"-- glucocorticoid receptor gene; (b) maternal gene; (c) maternal behavior; (d) fearful behavior.

(1B) What experiments did these authors conduct to determine whether maternal care behavior is genetically or non-genetically transmitted? _____

2. In 1960' scientists took helpful behavior for granted because they assumed animals should assist one another for the benefit of the species as a whole. It is then realized this "group selection" view has a major problem for natural selection to operate. Please explain this major problem. (2 points)

3. Animals that live together may help one another in various ways. Helpful interactions have a variety of fitness consequences for the participants. Some cooperative acts may immediately elevate the personal reproductive success of both cooperators (helper and recipient), this is an example of _____ (a) mutualism; (b) reciprocity; (c) tit for tat; (d) altruism. (2 points)

4. Calculate the genetic relatedness between two cousins (assume the gene can be acquired from either father or mother). Write down the detailed procedure how you calculate the relatedness. (2 points)

5. Based on the game theory's "prisoner's dilemma" game, players (or suspect) would get the optimal interest by using "defect" strategy, and reciprocity would less likely to be evolved. Reciprocal behavior is most likely evolved in which of the following animals? _____(2 points)

(a) solitary species; (b) territorial species; (c) colonial species; (d) species in which individuals don't recognize each other. (e) none of them.

1. The more food-storing behavior seen in a species, the greater the hippocampal volume, strongly supporting the hypothesis that hippocampal volume is a critical variable in the evolution of _____ (a) foraging behavior; (b) spatial memory; (c) food caching behavior; (d) all of above. (2 points)

2. In this article “Effects of experience and social context on prospective caching strategies by scrub jays”, the authors suggest that scrub jays display incredible feats of episodic memory and future planning.

(a) describe this episodic memory demonstrated by the scrub jay? (2 points)

(b) describe the future planning demonstrated by the scrub jay? (1 point)

3. Define eusocial species (2 points).

4. Bats use echolocation to identify the surrounding areas, their ability to recognize pond (flat water surface) is proved to be a _____ (innate or learned) behavior (1 point). For echolocation, the bats emit _____ (ultrasound or infrasound) to detect and capture insects (1 point).

5. Early college students have average 6-7 hours of sleep per day. One hypothesis states that sleep is important for their study and creativity. Please describe this hypothesis. (1 point)

1a. Octopus can swiftly change its body color and patterns to match the surrounding object, this cryptic behavior is specifically evolved for what purpose? _____ (foraging, predation, anti-predator, mating) (1 point)

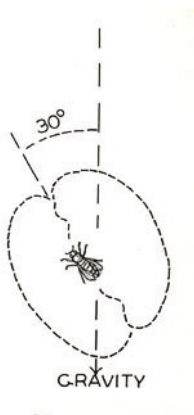
(a) predation. (b) anti-predation. (c) navigation. (c) mate choice.

1b. Scientists hypothesize that this cryptic strategy is evolved based on the principle of _____ (a) mimicry. (b) parsimony. (c) anti-predation, (d) neural mechanism. (1 point)

2. Why do pregnant women have evolved better spatial memory (and bigger size of hippocampus) than non-pregnant women? What is the scientific hypothesis proposed in this article to explain the evolutionary advantage of this behavior? (2 points)

3. Why do dogs provide a better model system than chimpanzees to study the social intelligence behavior (even though chimpanzees have a bigger brain and are highly intelligent in many behaviors)? (2 points)

4. Please explain what does this honey bee signal about the flower source? (2 points)



5. Scientists found a gene “for” (or foraging) that is particularly active when honey bees grow from sitter to foragers.

Hypothesis 1: “for” gene has a role on foraging behavior.

Hypothesis 2: “for” gene is related to age, and is nothing to do with foraging.

How do you design an experiment to prove or falsify these two hypotheses? (2 points).

1. During 1850-1950, the mutated black form of peppered moths become more dominant in many urban areas of England, this is due to (1 point):

- (a) whitish form change to black form, so they would not be detected by the predators and can survive in darkened forest.
- (b) Whitish moths dispersed to other areas where there are less darkened trees and can escape from predators.
- (c) whitish moths died because the predators can easily identify them in the darkened forest.
- (d) whitish moths gradually mutate to black form.

2. Monarch Butterflies have evolved a bright orange and black wings. This conspicuous color is a signal to _____ (a) predator (b) prey (c) mates (d) offspring. (1 point)

3. Moths can identify bat's location by perceiving the ultrasounds produced by the bats. If the bat comes from the right side, then _____ (2 points).

- (a) the A1 receptor firing more on the left side than on the right side.
- (a) the A1 receptor firing less on the left side than on the right side.
- (a) the A2 receptor firing more on the left side than on the right side.
- (a) the A2 receptor firing less on the left side than on the right side.

4. The communication between neurons is through _____ (a) action potential; (b) synapse; (c) dendrites; (d) axons; (e) all of above (2 points).

5. Please explain why more island animals went extinct (2 points).

6. How does Golden Crownbeard threaten the populations of albatross (2 points)?

1. One can use stable isotope, Deuterium to determine _____ (2 points):

- (a) The annual feather molting patterns.
- (b) The location where the migratory birds interact with the other species.
- (c) How long the migratory birds stay at the wintering or breeding ground.
- (d) The exact location where the migratory bird stay at the wintering or breeding ground.

2. Monarch Butterflies migrate 3000 miles one way. This long migration is achieved by _____ (a) 3-4 generations flying south; (b) learned experience through previous migration to guide the orientation; (c) 3-4 generation flying north; (d) all of above (2 points).

3. Two populations of the same species Blackcaps (a warbler species): Population #1 is fully migratory (from Central Europe); Population #2 is residential, non-migratory (an island close to Africa). You hypothesize this migratory behavior is controlled by genetic program, which one of the following statement is the correct prediction? _____ (2 points).

- (a) The offspring of cross-breeding between these two populations will have fully migratory behavior if they were placed in the central Europe.
- (b) The offspring of cross-breeding populations will have a residential, non-migratory behavior if they were placed in the island close to Africa where the temperature is warm and food is abundant whole year long.
- (c) The offspring of cross-breeding populations will be partially migratory and partially residential if they were placed in the laboratory.
- (d) The offspring of cross-breeding populations will be partially migratory and partially residential if they were placed in central Europe.
- (e) all of above.

4. What orientation methods are more important for nocturnal migrants?
_____ (a) Sun compass; (b) Star compass; (c) Magnet; (d) Moon; (e) all of above (2 points).

5. Please design and experiment to test whether migratory birds can use flight restlessness for star compass orientation (2 points).

1. True or false: The dominant high-ranking animals always have higher level of stress hormones than those of the lower ranking ones (1 point).
2. True or false: Clever Han's exceptional Mathematical skills was equivalent to a fourteen year old (1 point).
3. True or false: European blue tits's ability to open the milk bottle is due to the accidental use of their daily routine pecking behavior (1 point)
4. True or False: one can use social animals to study cognition because the social animals have a complex social communication system and social organization which will help us to (1 point).
5. True or False: Velvet monkeys produce several different kinds of innate alarm calls to signal different degree of danger or the type of predator. These calls are innately produced and perceived but require learning to associate with specific kind of predator (1 point).
6. Which of the following examples are animal's decision making? _____
 - (a) Juvenile *Anolis* lizards choose a territory
 - (b) Pied Wagtails allow satellites to co-defend their territory.
 - (c) American crows to fly at certain height to drop the nuts.
 - (d) Ground squirrel to emit alarm calls in the presence of predator.
 - (e) All of above. (2 points)
7. During fight, the subordinate animals tend to produce more of the following hormones _____ (a) testosterone; (b) serotonin; (c) glucocorticoid; (d) dopamine; (e) oxytocin. (1 point)
8. (a) Please define cognition (1 point).

(b) If you think animals do have cognition, provide one example, and explain how it fits into the definition of cognition. If not, please explain (1 point)

Animal Behavior**Quiz #11****Name** _____

1. Name a cognitive behavior that best defines each of the following animals (the examples we discussed in the class (8 points).

African Gray parrot _____

Pigeon _____

Chimpanzee: Kanzi _____

Chimpanzee: Washoe _____

Raven _____

Bottle-nosed dolphin _____

Gorilla: Koko _____

Sea lion _____

Honey bee _____

Scrub jay _____

Velvet monkey _____

2. What is the relationship between play and animal cognition? (1 point)

Use an example to demonstrate your statement. (1 points)

3. (extra point) What is the common name of this bird?

1. Dmitry Belyaev's domestication experiments demonstrate (1 point)
 - (a) Taming animals can be done by choosing the color of the animal.
 - (b) Animal's personality trait is associated with other physiological traits.
 - (c) Adrenaline (fight or flight) hormone is associated with skin color.
 - (d) Domestication may induce many behavioral or morphological changes that may reduce animal's survival in the wild.
 - (e) All of above.
2. DRD4 gene is associated with the personality of _____ (a) great tits (b) humans (c) dogs (d) chickens (multiple choice, 1point).
3. Individual personality (novelty-seeking) is partially determined by different length of DRD4 genes, these different length is due to _____(1 point) (a) more nucleotides in Intron; (b) more nucleotide repeats; (c) longer dopamine amino acids produced; (d) longer DNA sequence in Intron. (e) more exons in the genome.
4. Yes or No: Human is the only species that have evolved FoxP2 gene that enhances the evolution of human language. (0.5 point each)
5. Yes or No: Language is both learned and innate behavior.
6. Yes or No: Humans like chimpanzees have innate recognized consonants.
7. Yes or No: The basic grammar rules of human language is innate.
8. Yes or No: Broca's area is the specialized area for human speech perception.
9. Yes or No: Evolution of humans language facilitates the advance of human cognition, logic reasoning, and self-awareness.
10. Name one invertebrate animal that has demonstrated to have personality _____(1 point). What kind of personality ? _____ (1 point) .
11. Individual's political ideology is possibly determined by _____ (1 point)
 - (a) dopamine gene variant; (b) DRD4-7R; (c) friendship; (d) a combination of above.